



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/632,273	07/31/2003	Warren M. Farnworth	MI22- 2379	5475
21567	7590	12/14/2006	EXAMINER	
WELLS ST. JOHN P.S. 601 W. FIRST AVENUE, SUITE 1300 SPOKANE, WA 99201			ISLA RODAS, RICHARD	
			ART UNIT	PAPER NUMBER
			2829	

DATE MAILED: 12/14/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/632,273

Applicant(s)

FARNWORTH ET AL.

Examiner

Richard Isla-Rodas

Art Unit

2829

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 September 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 31-46 and 49-65 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 34, 35, 40, 42-44, 49, 50, 52 and 63-65 is/are allowed.
- 6) ☒ Claim(s) 31-33, 36-39, 41, 45, 46, 51 and 53-62 is/are rejected.
- 7) ☒ Claim(s) 34, 35, 40, 42-44, 49 and 63-65 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 October 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

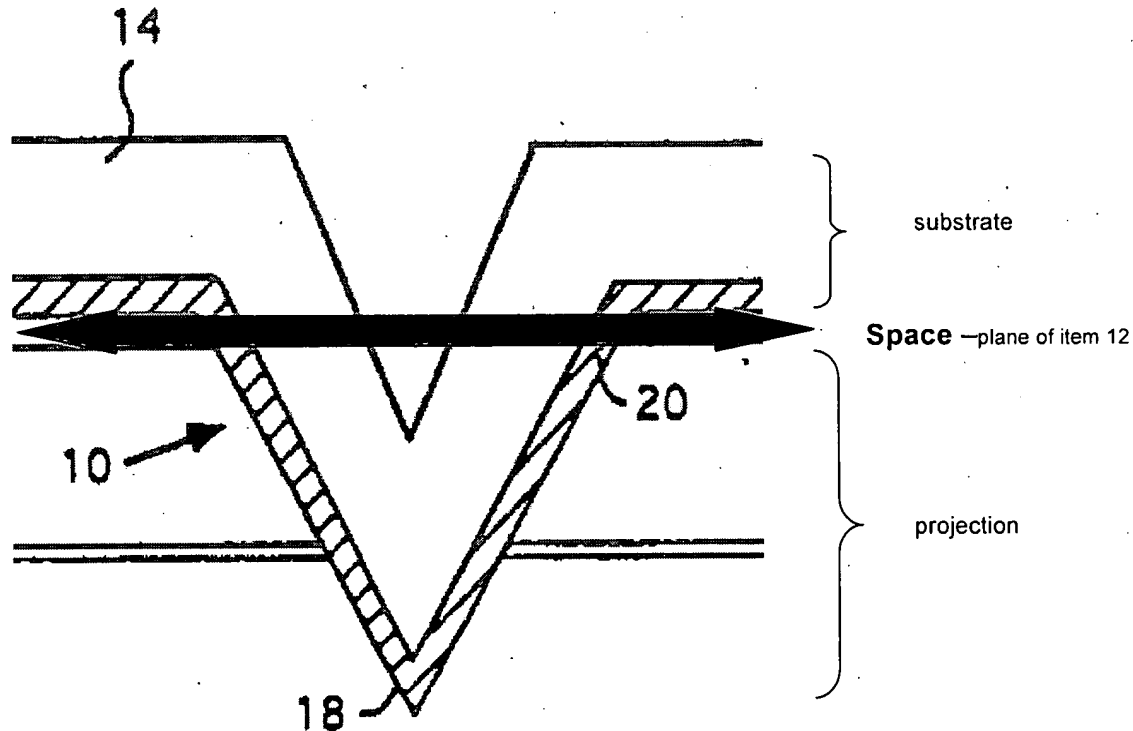
Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date: _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION***Response to Arguments***

1. Applicant's arguments, see page 12 lines 1-15, filed 9/11/2006, with respect to claim 47 have been fully considered and are persuasive. The rejection of claim 47 (amended to be included in as part of claim 31) has been withdrawn.
2. Applicant's arguments filed 9/11/2006, with respect to the rejection of claim 46 have been fully considered but they are not persuasive.

The applicant's argument that Leedy fails to teach or suggest an entirety of the projection is spaced from the substrate is not correct. Figure A below shows that Leedy's projection is in fact spaced from the substrate.

**Figure A**

Art Unit: 2829

3. Applicant has given no explanation in regards to the rejections of claims 55-57 and 59. Applicant does not state why it's believed Examiner is mistaken and limits his arguments to illustrations of embodiments in the application without answering the basic question raised by the examiner; *"how an intermediate structure can be positioned between the projection and the substrate since the projection comprises material of the substrate?"* For the purpose of examining the claim and after carefully studying the drawings, the examiner understands the claimed "intermediate structure" to be a further protrusion between the substrate and the projection.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 53, 55 and 56 are rejected under 35 U.S.C. 102(b) as being anticipated by the Us Patent to Leedy (5,323,035).

In terms of claim 53, Leedy anticipates (Figure 2) an engagement probe comprising: A substrate (that portion of 14 having its elevation above the level plane of item A projection (that portion of 14 having its elevation below the level plane of item 12) supported over the substrate and comprising material of the substrate; and A grouping of a plurality of projecting apexes (10) extending from the projection and positioned in

Art Unit: 2829

sufficient proximity to one another to collectively engage a single conductive pad on a semiconductor substrate (col 5, ln 39-40); Wherein an entirety of the projection is spaced from the substrate (that portion of 14 having its elevation below the level plane of item 12); as recited in claim 53.

As to claims 55 and 56, Leedy shows in Figure 2 an intermediate structure (that portion of 14 between the substrate and the projection, see **Space** in Figure A above), providing spacing of the projection from the substrate comprising a lateral dimension that is different from a lateral dimension of the substrate and a lateral dimension of the projection (they all have different lateral lengths).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 31-33, 36-39, 41, 45, 46, 51, 54, 57, 60, 58, 59, 61 and 62 are rejected under 35 U.S.C. 103(a) as being unpatentable over the US Patent to Leedy (5,323,035) in view of the US Patent to Asch et al. (4,520,314)

In terms of claims 31, Leedy shows in Figure 2, a substrate (14) comprising semi conductive material (dielectric material), a projection (that portion of 14 having its elevation below the level plane of item 12) supported over the substrate and comprising material of the substrate and a grouping of a plurality of projecting apexes (10)

Art Unit: 2829

extending from the projection. Leedy teaches all of the claimed elements, as recited above, except for the choice of preferred material (bulk semi conductive material) the substrate is made of. Asch et al. Teaches in Figure 1 a probe head arrangement, wherein the probe head (5) is made of one piece of monocrystalline silicon (bulk semi conductive material, as disclosed by the applicant in page 7, lines 8 and 9 of the submitted specification). It would have been obvious to one having ordinary skill in the art at the time of the invention was made to use monocrystalline silicon as the preferred material constituting the semi conductive material in Leedy's device, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. In re Leshi, 125 USPQ 416.

As to claim 32 the added limitation of comprising a plurality of such groupings for engaging multiple conductive pads on the semiconductor substrate (reference made to use of a plurality of insertion structures to make temporary and reliable electrical interconnection to the signal, power and ground contacts of an IC; see col 1, ln 20-31) is anticipated.

As to claim 33 the added limitation of the apexes being in the shape of multiple knife-edge lines is anticipated (having the apexes in this configuration is inherent to the teaching of Leedy because Leedy teach that its insertion structures can be configured in a plurality of arrangements further exemplified by its disclosed embodiments; in Figure 2, each insertion structure can be made with a "blade-like edge" as noted at col 4, ln 22-25).

Art Unit: 2829

As to claim 36 the added limitation of the grouping of apexes being formed on the projection that is supported by another projection (either 40 or 42 or both in combination), the another projection extending directly from the substrate is anticipated by Leedy (note this projection is positioned directly from substrate 14).

As to claim 37 the added limitation of the apexes having a selected projecting distance, the projecting distance being about one-half the thickness of the conductive pad which the apparatus is adapted to engage has no effect on the physical and dimensional aspects of the claimed invention that is limited to only an engagement probe and therefore does not further limit the claimed invention according to claim 31.

As to claim 38 the added limitation of the apexes projecting from a common plane (that portion between and on opposite sides of insertion structures 10 having a lateral horizontal surface) of the projection, the apexes having respective tips and bases, the bases of adjacent projecting apexes being spaced from one another to define a penetration stop plane therebetween (base of apexes are those portions of insertion structures 10 supporting its narrowest portion, the pointed tips, and the lateral horizontal surfaces, as noted above, define the penetration stop plane).

As to claim 39 the added limitation of the apexes projecting from a common plane (the upper horizontal border of layer 20) of the projection, the apexes having respective tips and bases of adjacent projecting apexes and being spaced from one another to define a penetration stop plane therebetween (base of apexes are those portions of insertion structures 10 supporting its narrowest portion, the pointed tips, and the lateral horizontal surfaces, as noted above, define the penetration stop plane), the

tips being a distance from the penetration stop plane of about one-half the thickness of the conductive pad which the apparatus is adapted to engage. (the italicized features have no effect on the physical and dimensional aspects of the claimed invention that is limited to only an engagement probe and therefore does not further limit the claimed invention according to claim 31).

As to claim 41 the added limitation of the conductive apexes constitute a first electrically conductive material (20), and wherein the conductive pads for which the probe is adapted have outermost portions constituting a second electrically conductive material; the first and second electrically conductive materials being different is anticipated (multiple choices of conductive materials are disclosed by Leedy [col 3, ln 25-29] and further note reference to dissimilar metals at col 3, ln 40-46).

As to claim 45 the added limitation of the plurality of projecting apexes extending from a substantially planar uppermost surface (that portion between and on opposite sides of insertion structures 10 having a lateral horizontal surface) of the projection is anticipated.

As to claim 46 having an entirety of the projection spaced from the substrate is anticipated by Leedy (that portion of 14 having its elevation below the level plane of item 12).

As to claim 51, Leedy anticipates (Figure 2) an engagement probe comprising: a substrate (that portion of 14 having its elevation above the level plane of item 12), a projection (that portion of 14 having its elevation below the level plane of item 12) supported over the substrate and comprising material of the substrate; a grouping of a

Art Unit: 2829

plurality of projecting apexes (10) extending from the projection and positioned in sufficient proximity to one another to collectively engage a single conductive pad on a semiconductor substrate (col 5, ln 39-40); and wherein the grouping of apexes is formed on, the projection which is supported by another projection (either 40 or 42 or both in combination), the another projection extending directly from the substrate (note this projection is positioned directly from substrate 14). Leedy teaches all of the claimed elements, as recited above, except for the choice of preferred material (bulk semi conductive material) the substrate is made of. Asch et al. Teaches in Figure 1 a probe head arrangement, wherein the probe head (5) is made of one piece of monocrystalline silicon (bulk semi conductive material, as disclosed by the applicant in page 7, lines 8 and 9 of the submitted specification). It would have been obvious to one having ordinary skill in the art at the time of the invention was made to use monocrystalline silicon as the preferred material constituting the semi conductive material in Leedy's device, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. In re Leshi, 125 USPQ 416.

As to claim 54, Leedy anticipates (Figure 2) an engagement probe comprising a substrate (that portion of 14 having its elevation above the level plane of item, a projection (that portion of 14 having its elevation below the level plane of item 12) supported over the substrate and comprising material of the substrate and a grouping of a plurality of projecting apexes (10) extending from the projection and positioned in sufficient proximity to one another to collectively engage a single conductive pad on a

Art Unit: 2829

semiconductor substrate (col 5, ln 39-40) and wherein the substrate comprise semiconductive material. Leedy teaches all of the claimed elements, as recited above, except for the choice of preferred material (bulk semi conductive material) the substrate is made of. Asch et al. Teaches in Figure 1 a probe head arrangement, wherein the probe head (5) is made of one piece of monocrystalline silicon (bulk semi conductive material, as disclosed by the applicant in page 7, lines 8 and 9 of the submitted specification): It would have been obvious to one having ordinary skill in the art at the time of the invention was made to use monocrystalline silicon as the preferred material constituting the semi conductive material in Leedy's device, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. In re Leshi, 125 USPQ 416.

As to claim 57 and 60, Leedy shows in Figure 2, teaches in Figure 1b, the projection comprises a lateral dimension (lacking a description in the claim of where the "lateral dimension" is measured to and from, the "lateral dimension" is taken as the lateral length of penetration) less than a lateral dimension of the substrate. Furthermore, a modification of prior art that involve a mere change in the size of a component is generally recognized as being within the level of ordinary skill in the art. In Rose, 105 USPQ 237 (CCPA 1955).

As to claim 58, Leedy teaches all of the claimed elements as discussed above, except for the choice of preferred material (bulk silicon) the apexes are made of. Asch et al. Teaches in Figure 1 a probe head arrangement, wherein the probe head (5) is

Art Unit: 2829

made of one piece of monocrystalline silicon (bulk semi conductive material, as disclosed by the applicant in page 7, lines 8 and 9 of the submitted specification). It would have been obvious to one having ordinary skill in the art at the time of the invention was made to use monocrystalline silicon as the preferred material constituting the semi conductive material in Leedy's device, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. In re Leshi, 125 USPQ 416. Furthermore, monocrystalline silicon is a bulk semiconductor as disclosed by applicant in page 7 lines 8-9 of the submitted specification. Monocrystalline silicon is made of silicon so inherently; Monocrystalline silicon is bulk silicon.

As to claim 59, Leedy shows in Figure 2 an intermediate structure (that portion of 14 between the substrate and the projection, see **Space** in Figure A), providing spacing of the projection from the substrate comprising a lateral dimension that is different from a lateral dimension of the substrate and a lateral dimension of the projection (they all have different lateral lengths).

As to claim 61, as stated with regards to claim 31, Leedy teaches a substrate (14) comprising semiconductive material. A wafer is a piece of semiconducting material.

As to claim 62, as stated with regards to claim 31, Leedy in view of Asch et al. teach a substrate (14) comprising monocrystalline silicon. Monocrystalline silicon is a bulk semiconductor as disclosed by applicant in page 7 lines 8-9 of the submitted

Art Unit: 2829

specification. Monocrystalline silicon is made of silicon so inherently; Monocrystalline silicon is bulk silicon.

Allowable Subject Matter

8. Claims 34, 35, and 40 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

In terms of claim 34, the prior art of record does not teach alone or in combination an engagement probe comprising a grouping of a plurality of projecting apexes having the shape of knife-edge lines wherein the multiple knife-edge lines are positioned to form at least one polygon, in combination with all other elements in claim 31.

In terms of claim 35, the prior art of record does not teach alone or in combination an engagement probe comprising a grouping of a plurality of projecting apexes having the shape of knife-edge lines wherein the multiple knife-edge lines are positioned to form at least two polygons one of which is received entirely within the other, in combination with all other elements in claim 31.

In terms of claim 40, the prior art of record does not teach alone or in combination an engagement probe comprising a grouping of a plurality of projecting apexes having the shape of knife-edge lines, the multiple knife-edge lines interconnecting to form at least one fully enclosed polygon, in combination with all other elements in claim 31.

9. Claims 42-44, 49, 63- 65 are allowed.

In terms of claim 42, the prior art of record does not teach alone or in combination an engagement probe having a grouping of apexes wherein the apexes are in the shape of multiple knife-edge lines being positioned to form at least one polygon, in combination with all other elements in claim 42.

In terms of claim 43 and 49, the prior art of record does not teach alone or in combination an engagement probe having a grouping of apexes wherein the apexes are in the shape of multiple knife-edge lines being positioned to form at least two polygons one of which is received entirely within the other, in combination with all other elements in claims 43 and 49 respectively.

In terms of claim 44, the prior art of record does not teach alone or in combination an engagement probe having a grouping of apexes wherein the apexes are in the shape of multiple knife-edge lines being interconnecting to form at least one fully enclosed polygon, in combination with all other elements in claim 44.

In terms of claim 50, the prior art of record does not teach alone or in combination an engagement probe comprising a substrate having a grouping of apexes wherein the apexes are formed on a projection which is supported by another projection, the another projection extending directly from the side of the substrate in combination with all other elements in claim 50.

In terms of claim 52, the prior art of record does not teach alone or in combination an engagement probe comprising a substrate having a grouping of apexes

Art Unit: 2829

wherein the apexes are formed on a projection which is supported by another projection, the another projection comprising material of the substrate in combination with all other elements in claim 52.

As to claim 63, the prior art of record does not teach alone or in combination an engagement probe comprising a grouping of a plurality of projecting apexes having the shape of knife-edge lines wherein the multiple knife-edge lines are positioned to form at least one polygon, in combination with all other elements in claim 63.

As to claims 64-65, the claims are allowable as they contain structure that further limits allowed claim 63.

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. US Patent to Welch et al. (4,862,243).

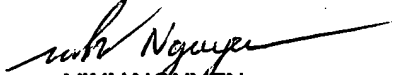
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Richard Isla-Rodas whose telephone number is (571) 272-5056. The examiner can normally be reached on Monday through Friday 8 am to 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ha Nguyen can be reached on (571) 272-1678. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2829

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Richard Isla-Rodas
December 11, 2006


VINH NGUYEN
PRIMARY EXAMINER
A. u. 2829
12/11/06